

Synthetic Rectifiers

Abstract

A synthetic rectifier comprises a MOSFET and a control circuit to turn the MOSFET off and on as a synchronous rectifier. The control circuit senses the current through the synthetic rectifier, and in particular is responsive to the rate of decrease of the current so as to anticipate when the current goes to zero and turn off at that instant. The control circuit also senses the voltage across the synthetic rectifier, and in particular is responsive to the rate of decrease of the voltage so as to anticipate when the voltage goes to zero and turn on the synthetic rectifier at that instant. In another embodiment of the invention, the MOSFET comprises groups of cells that can be individually controlled. As the current is decreasing, groups of cells can be turned off progressively as the current decreases so that only a small number of cells which can be turned off very fast is still conducting as the current goes to zero.